



Application Date: May 2, 1932. No. 12,531/32.

401.304

Complete Left: May 2, 1933,

Complete Accepted: Nov. 2, 1933.

7. Dez. 1933

PROVISIONAL SPECIFICATION.

Process for the Manufacture and Laying of Artificial Sporting Surfaces.

5 W. GEORGE HUGH HADFIELD, a British Subject, of Palermo, Albany Park Road, Kingston-on-Thames, and SAND & SHINGLE LIMITED, Faggs Road, Feltham, Middlesex, a British Company, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to the preparation of material for sporting surfaces, such as Cricket Pitches, Tennis Courts.

15 According to the present invention turf is imitated by the incorporation of fibrous materials, of which asbestos fibre is an example, with a suitably constituted soil compounded of graded clays, silts, sands, earths, powdered burnt clay, lime or marl, in such proportions as will yield a mixture which can be laid down in a damp state, rolled out to an even surface, and after wear be watered and repaired by turning over or rolling and re-rolling in a damp state giving immediately the original good surface owing to the plasticity of the mixed constituents.

25 If desired the material may be coloured and it may also be rendered slightly hygroscopic by the incorporation of glycerine or other suitable water absorbing reagents.

30 In the case of Cricket Pitches, the large bulk of ordinary players have usually to be content with inferior wickets, especially in the case of practice wickets. The turf is perhaps lumpy, only yields to prolonged watering, rolling and cutting, speedily becomes worn by play, and takes an immense amount of time, labour, and knowledge to bring back to a reasonable surface.

40 Beginners at the game of cricket are considerably handicapped in learning to play properly by the ball not coming truly from the pitch or rising at unexpected angles or to an undue height. This is particularly the case with small boys who even on true wickets have to play the ball at a greater relative height from the pitch than a man. On bad wickets the small boy easily loses confidence and consequently learns bad habits.

50 Under this invention, in the case of cricket pitches, the material might be laid

in specially prepared troughs of concrete of the necessary width, length and depth. The material when damp moulds easily, almost as well as potters clay. The fibre binds the other ingredients together without giving the compounded material the intractability of turf. The fibre also assists both the drying out, and re-wetting of the material. Any degree of hardness may be given to the resulting pitch which is a perfectly level and true one.

When the Pitch becomes worn and requires renovating, this may be done at a small expense of time and labour. The pitch is watered with a sprinkler and allowed to become damp through its whole thickness. Small quantities of fresh material may be added where there are holes or worn patches, the whole of the surface can be torn up and raked, and the pitch will once more roll out to a perfect surface. The process is repeated as often as may be required.

The whole process can be carried out very speedily and if quick drying is necessary heated rollers may be used to hasten the drying without damage.

Under this invention it is possible for coaches at Schools or at Cricket Nurseries to give advanced pupils special practice at will on almost any type of wicket, for example the "glue pot" wicket may be imitated by special compounding of the material and very rapid drying of the top surface leaving the bottom still soft; or a fast crumbling wicket may be produced by breaking down small areas of the surface artificially.

A typical mixture would be as follows, though I do not tie myself to exact proportions or particular ingredients,

1 part of asbestos fibre.

5 parts of pure impalpable clay.

4 parts of sand or silt passing a sieve 200 holes mesh to the linear inch or 40,000 holes per sq. in.

The above are calculated as constituting the material of the Pitch when bone dry but the compound is prepared as a wet paste ready for use.

Dated the 30th day of April, 1932.

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G. H. HADFIELD,

For and on behalf of
SAND & SHINGLE LIMITED,
H. J. GOLD,
Secretary.

COMPLETE SPECIFICATION.

Process for the Manufacture and Laying of Artificial Sporting Surfaces.

We, GEORGE HUGH HADFIELD, of Palermo, Albany Park Road, Kingston-on-Thames, British subject, and SAND & SHINGLE, LIMITED, of Fuggs Road, Feltham, Middlesex, a company organised under the laws of Great Britain, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the manufacture and laying of artificial sporting grounds.

The main object of the present invention is to provide a substitute for turf which is suitable for sporting grounds, for example, cricket pitches, tennis courts and the like.

According to the present invention an artificial sporting ground is formed from a mixture of fibrous material, a binder such as clay which becomes plastic when wetted and very finely divided non-plastic material. For the fibrous material asbestos is suitable, or a mixture of asbestos and sawdust or in some cases sawdust alone; for the plastic material, clay is suitable, and for the very finely divided non-plastic material, fine silicious material, for example, silica flour and or very fine sand; earths, powdered burnt clay, lime or marl may also be used. The materials are employed in such proportions as will yield a mixture which can be laid down in a damp condition, rolled out to an even surface, and after wear be watered and repaired by turning over or rolling and re-rolling in a damp state, whereby the original good surface is readily obtained owing to the plasticity of the materials. For example the proportions, fibrous material 5—45% pure clay element 5—25%, and the remainder of fine silicious material give good results.

Preferably these materials are laid on a layer of earth and very fine silicious material, such as loamy sand, and this layer is preferably laid on a foundation of concrete or like material which may be in the form of a shallow trough. The layer of fine silicious material and loamy sand may be replaced by or have added thereto

sawdust, cork dust or other more or less resilient material which has the effect of making the ground more "dead".

If desired, the material may be coloured and it may also be rendered slightly hygroscopic by the incorporation of glycerine or other suitable water absorbing reagents.

In the case of cricket pitches, the large bulk of ordinary players have usually to be content with inferior wickets, especially in the case of practice wickets. The turf is perhaps lumpy, only yields to prolonged watering, rolling and cutting, speedily becomes worn by play, and takes an immense amount of time, labour and knowledge to bring back to a reasonable surface.

Beginners at the game of cricket are considerably handicapped in learning to play properly by the ball not coming truly from the pitch or rising at unexpected angles or to an undue height. This is particularly the case with small boys who even on true wickets have to play the ball at a greater relative height from the pitch than a man. On bad wickets the small boy is apt to lose confidence and consequently learns bad habits.

In the case of cricket pitches or tennis courts made according to the present invention, the material may conveniently be laid in specially prepared troughs of concrete of the necessary width, length and depth. The concrete affords an even foundation and excludes worms.

The material when damp moulds or dries almost as well as potter's clay. The fibre binds the other ingredients together without giving the compounded material the intractability of turf. The fibre also assists both the drying out and re-wetting of the material. Any degree of hardness may be given to the resulting pitch which is level and true.

Once the wicket is dry and hard it may be covered in and protected from rain when not in use.

In the case of practice wickets the side wings of the "net" may be made of canvas for this purpose, the side wings being folded down and supported on one or more trestles when it is desired to protect the

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wicket. If the wicket is protected from rain it is believed that it will wear for many weeks as it is found individual spots will stand many hundreds of blows from a

5 cricket ball without breaking up or crumbling. The result is that once made and dried no attention is required except to move the covers. If, however, as a result of being played on when damp the
10 pitch becomes worn and requires renovating, this may be done at a small expense of time and labour. The pitch is watered with a sprinkler and allowed to become damp. An effective way of evenly wet-
15 ting the surface of the whole pitch or individual patches is to put an inch of sawdust on the surface and keep this soaking wet. Small quantities of fresh material may be added where there are
20 holes or worn patches, the whole of the surface can be torn up and raked and the pitch will once more roll out to a perfect surface. The process is repeated as often as may be required.

25 The whole process can be carried out very speedily and if quick drying is necessary heated rollers may be used to hasten the drying without damage.

Under this invention it is possible for
30 coaches at schools or at cricket nurseries to give advanced pupils special practice at will on almost any type of wicket, for example, the "glue pot" wicket may be imitated by special compounding of the material and very rapid drying of the top
35 surface leaving the bottom still soft; or a fast crumbling wicket may be produced by breaking down small areas of the surface artificially.

40 In one way of carrying out the invention as applied to a cricket pitch, the ground is first dug out to a depth of 3" over the required area. Next a coating of 1½" of porous concrete made of shingle and cement with a shortage of sand is laid
45 in the bottom and at the same time a wooden curbing of 4" x 2" quartering put in as a surround and left level with the surrounding ground. When the concrete has set, a mixture of earth and very fine
50 loamy sand is filled in on top of the concrete and rolled and consolidated to within ¼" of the top of the curbing, or very fine loamy sand may be used alone if the sand is sufficiently loamy.

55 Finally, a finishing coat of compound consisting of:—

- 16% of asbestos fibre,
- 10% of pure clay element,
- 60 24% of silica flour, and
- 50% of very fine sand

is laid as a top coat to the thickness of 1", thus bringing the pitch to the level of the curbing and surrounding ground. The
65 proportions are calculated when the

materials are dry. In practice it is preferable to prepare the compound as a wet paste ready for use.

By "pure clay element" is meant the plastic portions of ordinary clay separated
70 by elutriation from the fine silts and sands which most natural clays contain in larger or smaller proportions. If a natural clay is employed containing a given amount of fine silts or sands, the amount of silica
75 flour and very fine sand will be diminished by that amount.

The intermediate coating between the concrete and the finishing coat may be varied as may be the composition of the
80 finishing coat.

For example, we may employ in the intermediate coating a layer of sawdust, cork dust, ash or other more or less
85 resilient material, or these materials may be compounded with the intermediate material; the resulting wicket, although hard when dry, will be more dead and for small boys the ball will only rise to a
90 suitable height.

The same principle may be adopted in the finishing coat, for example, by increasing the fibre content. In the case of tennis courts, this will give a less hard
85 surface for the feet thus resembling a turf court, rather than the usual hard rubble court which is well known to be tiring owing to its unyielding character.

We vary the amounts of the fibrous material, clay element and silts according
100 to the purpose required. Another example of material suitable for forming the top layer, e.g. of a tennis court, would be:

- Asbestos fibre 16-44% 105
 - Sawdust Nil-24%
 - Pure clay element 6-12%
- with silica flour and fine sands as the balance.

The material for the finishing coating
110 may be prepared in either a dry or a paste form. If dry, it must of course be damped for rolling and keying to the intermediate coating.

A very quick way of laying and finish-
115 ing the top coating is to spread the material in the condition of mortar and roll with absorbent cloth, blanket material or sacks between the surface of the material and the roller. We have found
120 that until the material is consolidated to a certain extent it has a tendency to pick up on the roller. The interposition of the blanketing obviates this and thereafter permits direct rolling with the roller at
125 a much earlier and wetter stage than is otherwise possible. The finishing can be considerably accelerated if a heated roller be employed, and if a material, such as
130 asbestos, be employed as the fibrous

material, there is substantially no risk of damaging the material even if the roller be heated to a temperature greatly exceeding that which would injure a material such as turf, for example.

For repairing or patching, the original coat must be wetted up and slightly scarified to give a key before new material is applied. Holes may be cut out and entirely replaced by new material.

In the case of cricket pitches, particularly practice wickets, the turf at the bowler's end is subjected to very hard wear. The batsman's end, if covered when not in use and only played on when dry, gets very little wear. To overcome this, when wear has taken place at the bowler's end, the footholes may be cut out as would ordinarily be done, but instead of being replaced by new turf which requires time to marry and become firmly knit with the surrounding and underlying soil, 2" of the topping material is used. This material may also be employed to replace or repair any turf which has become worn.

The effect of rolling is to bring the moisture to the surface. The fine particles of clay and silt come up with the moisture and leave a very smooth, well bound, hard wearing surface. Cricket pitches made in this manner will stand a very large number of blows from a cricket ball in the same spot without breaking up or crumbling. Consequently the wicket is very long lasting and hardwearing.

As has been shown, it may be easily and quickly brought back to its original state when it does become worn.

Apart from variations in the intermediate coating, such as have been described above, any soil may be used so long as it will just bind and form a sound foundation. We have found that a very light soil, i.e. one of an arenaceous nature, gives the best foundation as it allows moisture to penetrate and get away and also is not so liable to shrink as is a heavy loam.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An artificial sporting ground formed with a mixture of fibrous material, a binder such as clay which becomes plastic when wetted, and very finely divided non-plastic material.

2. An artificial sporting ground formed from a mixture of fibrous material, clay and fine silicious material.

3. An artificial sporting ground as

claimed in claim 1, comprising fibrous material 5—45%, pure clay element 5—25%, and fine silicious material as the remainder.

4. An artificial sporting ground formed from a mixture of asbestos fibre, as pure clay element and fine silicious material.

5. An artificial sporting ground as claimed in the preceding claim, and consisting of asbestos fibre 16—44%, sawdust 16—24%, pure clay element 6—12% with silica and fine sand as the balance.

6. An artificial sporting ground in which the mixture claimed in any of the preceding claims is laid on a layer of earth and very fine silicious materials such as loamy sand.

7. An artificial sporting ground in which the mixture (or mixtures) claimed in any of the preceding claims is laid on a concrete or like foundation.

8. An artificial sporting ground as claimed in claim 6, in which the layer of earth and very fine silicious material is replaced by or has added thereto resilient material, such as sawdust, cork dust or ash.

9. The combination with an artificial sporting ground claimed in any of the preceding claims of a "net" made of canvas or other suitable material adapted to be folded down over the said ground and one or more trestles to support the said net.

10. The method of laying and finishing an artificial sporting ground as claimed in any of the preceding claims, which consists in spreading the material of the top layer in the condition of mortar, and rolling it, absorbent material such as cloth, flannel material or sacks being interposed between the top surface and the roller.

11. The method of laying and finishing an artificial sporting ground as claimed in the preceding claim, in which the roller is heated.

12. An artificial sporting ground as claimed in any of the preceding claims, in which the materials are rendered slightly hygroscopic.

13. An artificial sporting ground, substantially as described.

14. The manufacture of an artificial sporting ground, substantially as described.

Dated this Second day of May, 1933.

CARPMAN & RANSFORD,

Agents for Applicants.

24, Southampton Buildings, London, W.C. 2.

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